

**ABSTRACT:****An Optical Device and Method for its Manufacture**

An optical device which can operate as a single photon emitter 1, comprising a three dimensional optical cavity 7 which spatially confines a photon to the order of the photon wavelength in all three dimensions. The cavity 7 is configured to define preferred emission direction for photons entering the cavity. A photon can be supplied to the cavity using a quantum dot 5. Strong coupling can occur between the cavity 7 and the quantum dot 5 which causes the formation of two hybridised modes. Switching on an off the coupling by irradiating the device with radiation having an energy equal to that of one of the hybridised modes allows the device to act as an optical switch.

Figure 1